

neogaeus, a relationship which is attributed to a line of passage for American and Siwalik life through the regions to the westward of China. Several limb-bones of felines are described and figured, but it has not been found possible to refer them with certainty to species, though their general affinities are indicated. Finally *Hyenodon* is placed as the type of a family in this position. This genus with its allies was placed by Gaudry with the marsupials, by Cope in an order Creodonta, by Huxley they are placed between the Carnivora and Insectivora, and this view is provisionally adopted by the author. *Hyenodon* is otherwise only known from Europe and North America, first appearing in the Paris basin. The *Hyenodon indicus* is only known from very imperfect materials; it resembles the *H. horridus* of America in size, and makes a closer approximation to the smaller *H. Heberti* from Quercy. The part concludes with a bibliography of fossil Carnivora. There are also a preface, contents, and introductory observations, some corrections, and an index to the volume. This monograph is an exceedingly able account of the subject with which it deals, is a great contribution to the history of fossil mammals, and honourable in every way to the Indian Survey and to the author. The manner in which the recent and fossil collections in this country have been utilized in elucidating the fossils shows how great were the difficulties of working at such a distance as Calcutta upon such a subject; but there is happily little in which to differ from the author, unless it be a slight over-anxiety on his part to turn knowledge to account in extracting conclusions from materials which are not always the most satisfactory. We would suggest, too, that in the matter of geological nomenclature terms like Miocene and Pliocene, which are often indefinite, should be discarded for the local names of the deposits which are referred to. The plates show a marked improvement on those executed in India, some of them being of the highest merit. We have said nothing of the excellent arrangement of the matter, of the clear description and terse style, and full quotation of scientific materials; but these, too, merit consideration in a work which must be a standard authority in mammalian palaeontology.

Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,' 1881-82. London: Printed by order of the Trustees [of the British Museum], 1884. 8vo, xxv & 684 pp., 54 pls.

WHEN we know that the handsome volume before us was being prepared during the time of heavy work entailed on the Zoological Department of the British Museum by the removal of the collections from Bloomsbury to South Kensington, we are led to reflect not only on the working-capacities of that staff, but on the multifarious duties that fall on those who are entrusted with the care of our National Collections. In addition to the daily labour of receiving and incorporating the new specimens of which the Museum is

only anxious to have more, of preserving those that it already has, and of improving the modes by which the more suitable are presented to the public eye, and others arranged for the better use of the student, the publication of this Report, like that of preceding papers published in this Journal and elsewhere, proves that the Admiralty and the Officers of the Navy are well aware now that collections sent to the British Museum will, with all proper despatch, be worked out, and the results added to the stock of human knowledge.

While this is, in itself, a satisfactory state of things, we think that yet another cause of congratulation is to be found in the well-advised arrangement of presenting these results in a connected form and as a complete work; we have here one of the few means by which the growing disease of specialization may be mitigated, though not, we fear, cured. The volume now under consideration is, then, first of all important from the point of view that it enables a student to gain a very close acquaintance with a large part of the marine invertebrate fauna of the Indo-Pacific Ocean as a whole; the student of the Mollusca may learn what Crustacea, Echinoderms, and Sponges live with a given set of shell-fish; and the philosophic student of the relations of different forms one with another has a rich store of facts from which he may work.

In the next place, we welcome the publication of this volume and the character of its contents, because we are fully convinced that there are great opportunities for the naval officers of such a nation as ours, if only the authorities at home will give the necessary assistance to such members of the Navy as are willing to follow in the steps of Dr. Coppinger, to whose great services as a collector Dr. Günther very properly ascribes the success of the voyage. In this connection it is well to point out that here, as in other matters of marine investigation, the American nation is far in advance of the "mother-country." In the Bulletin of the United States Fish Commission for 1883 (p. 239), Prof. Spencer F. Baird has a note on "the instruction of naval midshipmen in taxidermy, ichthyology, &c. at the United States National Museum, and on board the steamers of the U. S. Fish Commission," from which we learn that an experiment is now being made "to have as a part of the regular force of the Navy officers competent to do the scientific work for which it has generally been necessary to employ civilians, as also on any cruise to be able to utilize, to some extent at least, the opportunities of research which constantly present themselves to the inquirer."

In estimating the work done by Dr. Coppinger it is necessary to bear in mind that when the 'Alert' was in the Straits of Magellan a large collection was made; the report on this was likewise prepared by the Staff of the British Museum, and occupies the first 141 pages of the 'Proceedings of the Zoological Society' for 1881. From the Indo-Pacific, "irrespective of a number of specimens set aside as duplicates, not less than 3700, referable to 1300 species, were incorporated in the National Collection; and of these more

than one third (490) were new additions, if not to science, at any rate to the Museum."

Dr. Coppinger introduces the report by a short account of the voyage, the longer account of which in his own volume is doubtless known to all our readers; he is followed by Mr. Thomas, who describes nine Melanesian skulls, and by Mr. Sharpe, who, of course, gives a careful account of the birds submitted to him. The most interesting and, from a general point of view, the most important portion of Dr. Günther's contribution is the demonstration that the view held by Sundevall, but rejected by most ichthyologists, that there is more than one species of *Amphioxus**, is quite correct; one cannot refrain from noting the grim humour of positive science when we reflect that the battle between Semper and Hückel as to the mono- or polyphyletic origin of species was largely based on the doctrine that *Amphioxus lanceolatus* was a cosmopolitan species. Five species are recognized by Dr. Günther, one of which (*Branchiostoma bassanum*) is new.

Mr. Edgar Smith deals with 214 species of Melanesian Mollusca; it is a subject for regret that he has not drawn on his wide knowledge of this group, and given us a detailed comparative account of its distribution.

Prof. Jeffrey Bell reports on 124 Echinoderms from the Melanesian seas, and directs attention to the value of coloration in the numerous species of the genus *Ophiothrix*, to which he ascribes less importance than preceding workers; he returns to the question of the use of formulæ, which he illustrates by the Crinoidea, and he insists at some length on the doctrine that the greater part of the fauna common to different parts of the Indo-Pacific Ocean follows isothermal rather than geographical boundaries; it is clear that he has been brought to this conviction by facts and against some earlier conceptions. The Echinodermata being as a whole of wide distribution, it is very important to know that the great majority of the Crinoids are very closely limited in area; "for the elucidation of the details of this tropical fauna, we may look with almost more than confidence to the information afforded by the species of Crinoids: here, however, the cabinet naturalist can as yet only appeal to the collector."

The extent of the British-Museum collections and the great knowledge of the distribution of the higher Crustacea possessed by Mr. Miers are well shown by the report on the Crustacea which is contributed by that naturalist. The Australian student of the Crustacea must carefully study the facts here recorded, as a large number of the species here noted are not described in Mr. Haswell's recent Catalogue.

Mr. Ridley reports on the Alcyonaria and Sponges; he enters into the details of the distribution of these forms on different parts of the Australian coast, and summarizes his results in tables so arranged as to afford considerable information at a glance.

* We must ask pardon for using for this Cephalochordate the name by which it is known to all zoologists except ichthyologists.

The second part of the report deals with the collections from the Western Indian Ocean; a number of islands lying on the eastern coast of Africa, whose zoological characters were incompletely or altogether unknown, were visited by Dr. Coppinger, and "sufficient materials were accumulated to connect their natural history with that of Seychelles to the northward, and Madagascar to the southward."

Like all the recent publications of the Zoological Department, the present bears ample evidence of the editorial care of the Keeper: we have noted but two misprints, which are both easily corrected by the context; the plates are, on the whole, very satisfactory, but those of the Comatulids ought to have been more highly magnified, and some of the Crustacea would have been better if more work had been put into them by the artist.

We may be pardoned for suggesting to Mr. Miers that the correct form of the technical name of the Sessile-eyed Crustacea is *Hedri-* and not *Edriophthalmata*.

The Trustees have rendered a great service to science by undertaking the publication of this work; not only have they given an opportunity to the staff to show their powers of work, but they have, we believe, afforded to the Admiralty and to the country a conclusive proof that a large zoological collection need not go here and there to find describers, but that there is a body of men ready at hand to undertake the necessary labour. The fact that some groups are not represented seems to us to be only a proof that the staff might well be increased in numbers.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

May 28, 1884.—Prof. T. G. Boney, D.Sc., F.R.S.,
President, in the Chair.

The following communications were read:—

1. "On the Fructification of *Zeilleria* (*Sphenopteris*) *delicatula*, Sternb., sp., with remarks on *Ursatopteris* (*Sphenopteris*) *tenella*, Brongn., sp., and *Hymenophyllites* (*Sphenopteris*) *quadridactylites*, Gutb., sp." By R. Kidston, Esq., F.G.S.

In this paper the author noticed the fructification of three species of Ferns which have been described as belonging to the genus *Sphenopteris*, for two of which he proposed the establishment of new genera. *Sphenopteris delicatula*, Sternb., referred by Stur to *Calymmatotheca*, is made the type of one of these genera, *Zeilleria*, in which the involucre are borne at the extremity of the pinnule-segments, which are more or less produced to form a pedicel; in their earlier condition the involucre are globular, but when mature they split into four valves. In *Calymmatotheca* the fructification consists of a number of elongated sporangia arranged in a circle around a com-